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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
SIMS, JASON M	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/529,509	GUITTET ET AL.	
	Examiner	Art Unit	
	JASON M. SIMS	1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 October 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5,7-11 and 13-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,7-11 and 13-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 October 2009* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/27/2009 has been entered.

Applicant's arguments, filed 10/27/2009, have been fully considered. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set presently being applied to the instant application.

Applicants have amended their claims, filed 10/27/2009, and therefore rejections newly made in the instant office action have been necessitated by amendment.

Claims 1-5, 7-11, and 13-17 are the current claims hereby under examination.

Claim Rejections - 35 USC § 112-First Paragraph

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 13-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to

one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 13 (and all claims dependent therefrom) comprise the wording "the carrier medium not being a non-physical carrier medium" in the preamble of said claim 13, wherein support for said wording was not found in the instant specification. It is noted that on page 16, last paragraph, applicant has recited that a computer program can be "recorded on a carrier medium." Thus a carrier medium is supported by the instant specification. However, there is no support for such carrier medium being a non-physical carrier medium, i.e. support for the negative limitation being recited in the instant claims. Therefore, the instant claims have been found to comprise new matter.

Claim Rejections - 35 USC § 112-Second Paragraph

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-5, 7-11, and 13-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 7, and 13 (and all claims dependent therefrom), at step d)-v) comprise the word "medium," which has been deemed as vague and indefinite. Step d)-v) requires counting the number of first objects containing at least "medium" sized holes to provide a tubules parameter, wherein it is unclear as to what constitutes "medium." Applicant has not defined what would constitute "medium" and therefore, it would be

unclear as to which objects to include in said counting because the threshold for determining "medium" holes has not been defined. Clarification via clearer claim wording is required.

However, for the purposes of examination, the word "medium" has been interpreted as meaning those holes, which would wind up being identified as tubules.

Claim Rejections - 35 USC § 102

Response to Arguments

Applicant's arguments with respect to claims rejected under 35 U.S.C 102 have been considered but are moot in view of the new ground(s) of rejection.

However with regards to applicant's argument at pages 18-19 that the Cheng reference lacks enablement, "even if a reference discloses an inoperative device, it is prior art for all that it teaches." Beckman Instruments v. LKB Produkter AB, 892 F.2d 1547, 1551, 13 USPQ2d 1301, 1304 (Fed. Cir. 1989). Therefore, "a non-enabling reference may qualify as prior art for the purpose of determining obviousness under 35 U.S.C. 103." Symbol Techs. Inc. v. Opticon Inc., 935 F.2d 1569, 1578, 19 USPQ2d 1241, 1247 (Fed. Cir. 1991).

The following rejections are being newly applied which have been necessitated by amendment:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 3-5, 13, and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cheng et al. (Submitted on IDS filed 7/25/2005).

The claims are drawn to a method of grading tubules in a first image of a histological slide, the method having the steps of:

a) providing a second image distinguishing first objects in the first image which are sufficiently large to indicate potential tubules and have pixel values at boundaries indicating epithelial layers,

b) providing a third image distinguishing second objects in the first image which have pixel values not indicating epithelial layers, but instead fat and holes within tubules,

c) combining data from the second and third images to identify as holes within tubules those contained second objects which are contained within first objects by

excluding objects not indicated to have epithelial layers and first objects not containing second objects

d) performing one or more of the following:

i) counting as tubules those of the first objects which have contained second objects within them to provide a number of tubules parameter,

ii) counting the first objects to provide a number of objects parameter and determining a parameter expressing the number of tubules parameter as a proportion of the number of objects parameter,

iii) determining the relative areas of contained second objects as proportions of respective first objects within which they are located to provide respective ratio parameters,

iv) determining the total area of contained second objects as a proportion of total area of first objects within which they are located to provide a surface area ratio parameter, and

v) counting the number of first objects containing at least medium sized holes to provide a tubules parameter.

vi) counting the number of first objects containing at least medium sized holes to provide a parameter T, and

e) grading the first image's tubules on the basis of the one or more parameters as aforesaid with reference to parameter threshold values, and

f) using the grading of the first image’s tubules to provide a tubule score for use in diagnosis.

With regards to limitations of claims 1 and 13: Cheng et al. at the abstract teach a method of grading tubules in digitized images of microscopic slides of breast cancer malignancies, which reads on the preamble of the instantly claimed method. Cheng et al. at page 323, step A) disclose enhancing a digitized image using a median filter, which is interpreted as a first image. Cheng et al. at page 323, part B. teach a method of further filtering the enhanced image by separating "the background and normal cell areas from the tubular areas using an image threshold," which reads on step a). Cheng et al. at page 324 define a tubule area as a homogeneous area enclosed by a circular dark boundary, i.e. an epithelial layer (as applicant has stated in paragraph [0083] of their published application a tubule "appears as a white area surrounded by a dark epithelial layer (or boundary)"). Therefore the filtering method taught by Cheng et al. of the enhanced image has been interpreted as reading on a second image wherein the separation process reads on distinguishing first objects in the first image which are sufficiently large to indicate potential tubules and have pixel values at boundaries indicating epithelial layers. Cheng et al. at page 323, step C, pages 323-326 teach a step of further analyzing the filtered image by separating objects in the image as tubule areas from rough texture areas. Cheng et al. at page 322, last paragraph define rough texture areas as areas comprising fatty tissues and glands. Therefore, the separation process taught by Cheng et al. reads on limitations of step b) of providing a third image distinguishing second objects in the first image which have pixel values not indicating epithelial layers but instead fat and holes within tubules. In addition, the classification of the bright areas into tubule areas and non-tubule areas taught by Cheng et al. is a

process which combines the data from the second and third images because you have to combine the data in the method of Cheng et al. in order to perform the analysis. Moreover, Cheng et al. teach in the method of distinguishing tubule areas from non-tubule areas (i.e. rough textures/fat) to identify as holes within tubules those contained second objects which are contained within the first object by excluding objects not indicated to have epithelial layers and first object not containing second objects. This is because the second objects taught by Cheng et al. are those areas which have pixel values indicating fat and holes within tubules and not having epithelial layers. The second objects, i.e. rough textures, are contained within the first objects, because Cheng et al. first identifies "tubular areas," i.e. first objects, and then filters the “tubular areas” into real tubules and rough textures as taught at step b) of pages 323-326. Cheng et al. further excludes objects not indicated to have epithelial layers and first objects not containing second objects by separating the tubule areas from the rough texture areas, see page 326, lines 1-6. Therefore, the separation step is an exclusionary step as recited in the instant claims step c). Cheng et al. at page 326, step D and last paragraph, stage four, teach a method of counting the tubule areas and using the counting to obtain a score for physicians. Because Cheng counts the classified “tubules” which are within the first objects, this method reads on counting the number of first objects containing at least medium sized holes to provide a tubules parameter. Therefore, Chengs' method step D/stage four reads on instantly claimed step d), substep v), step e), and step f).

Cheng et al. suggest, but do not explicitly teach a method of providing a second and third image.

Cheng et al. suggest providing a second and third image because they teach a method of performing distinct image analysis steps to a first image. Cheng et al. teach enhancing the first image by distinguishing first objects in the first image which are potential tubules, thus suggesting a second image. Cheng et al. further teach filtering the distinguished objects by distinguishing second objects, i.e. rough textures, from tubules, thus suggesting a third image.

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to have provided the second and third images as claimed in the method taught by Cheng et al. for grading tubules in digitized images of microscopic slides of breast cancer malignancies. This is because storing the data being processed in image analysis, i.e. providing, for further image analysis steps is part of the routine process of image analysis. Thus, the limitations of providing second and third images are not the product of innovation, but of ordinary skill and common sense. Therefore, the differences between the claimed invention and the prior art were encompassed in a principal known in the art. Furthermore, all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions and the combination would have yielded nothing more than predictable results to one of ordinary skill at the time of the invention.

With regards to claim 13 directed to a software program comprising instructions, i.e. program, Cheng et al. teach a computer system for implementing the algorithms, wherein the computer executing the algorithms inherently comprises the instructions on a computer readable medium at pages 327 and 328.

Cheng et al. at pages 323-328 teach wherein bright area pixels have different binary values than darker area pixels and using a thresholding of the first image (see page 326), which reads on limitations of claims 3 and 15.

Cheng et al. suggest, but do not explicitly teach providing a fourth binary image.

Cheng et al. suggest this because at page 326, Step E), stage 2, they teach reducing the image to binary values of the image, thus teaching a binary image.

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to have provided a fourth binary image as claimed in the method taught by Cheng et al. for grading tubules in digitized images of microscopic slides of breast cancer malignancies. This is because storing the data being processed in image analysis, i.e. providing a fourth binary image, for further image analysis steps is part of the routine process of image analysis. Thus, the limitation of providing a fourth binary image is not the product of innovation, but of ordinary skill and common sense. Therefore, the differences between the claimed invention and the prior art were encompassed in a principal known in the art. Furthermore, all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions and the

combination would have yielded nothing more than predictable results to one of ordinary skill at the time of the invention.

Cheng et al. teach at page 325, step 5, implementing a logical AND operation between respective pixels between the second and third image analysis steps as in claims 4 and 16 step b).

Cheng et al. at pages 323, step C and 326, step D., wherein a physician determines thresholding values in the method of grading tubules, which reads on the limitation of grading tubules comparable with that of a physician, i.e. medical expert as in claims 5 and 17.

Claims 7 and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cheng et al. (Submitted on IDS filed 7/25/2005) as applied to claims 1, 3-5, 13, and 15-17 above and further in view of Boon et al. (US P/N 5,939,278).

Cheng et al. teach the limitations of claims 1, 3-5, 13, and 15-17 as described above.

Cheng et al. teach the computer programmed steps a)-f) of claim 7 as described above with reference to claims 1 and 13.

With regards to claim 7 directed to an apparatus incorporating a microscope and a camera for photographing a histopathological specimen to obtain digitized color image data and a computer means for receiving the digitized color image data, Cheng et al. do not explicitly teach these limitations of the preamble.

Boon et al. also teach a method directed towards the automated classification of a histological specimen. Boon et al. teach at col. 4, lines 42-61 using a microscope and a camera for photographing a histological specimen to obtain digitized colour image data and a computer means for receiving the digitized colour image data.

It would have been obvious to one of ordinary skill in the art to have used the apparatus comprising a microscope and a camera for photographing a histological specimen to obtain digitized colour image data and a computer means for receiving the digitized colour image data as taught by Boon et al. for use in the method of analyzing digital images of histological specimens as taught by Cheng et al. This is because Boon et al. exemplifies that using a microscope and camera for obtaining digitized images of histological specimens is well known in the art. Therefore, the differences between the claimed invention and the prior art were encompassed in known variations or in a principal known in the prior art. Therefore, the claimed apparatus is not the product of innovation, but of ordinary skill and common sense. One of ordinary skill in the art would have recognized that the results of applying the known technique taught by Boon et al. to the method taught by Cheng et al. would have been predictable at the time of the invention.

Cheng et al. at pages 323-328 teach wherein bright area pixels have different binary values than darker area pixels and using a thresholding of the first image (see page 326), which reads on limitations of claim 9.

The combination of Cheng et al. and Boon et al. suggest, but do not explicitly teach providing a fourth binary image.

The combination suggest this because Cheng et al. at page 326, Step E), stage 2, they teach reducing the image to binary values of the image, thus teaching a binary image.

It would have been obvious to one of ordinary skill in the art at the time of the instant invention to have provided a fourth binary image as claimed in the method taught by Cheng et al. for grading tubules in digitized images of microscopic slides of breast cancer malignancies. This is because storing the data being processed in image analysis, i.e. providing a fourth binary image, for further image analysis steps is part of the routine process of image analysis. Thus, the limitation of providing a fourth binary image is not the product of innovation, but of ordinary skill and common sense. Therefore, the differences between the claimed invention and the prior art were encompassed in a principal known in the art. Furthermore, all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions and the combination would have yielded nothing more than predictable results to one of ordinary skill at the time of the invention.

Cheng et al. teach at page 325, step 5, implementing a logical AND operation between respective pixels between the second and third image analysis steps as in claim 10, step b).

Cheng et al. at pages 323, step C and 326, step D., wherein a physician determines thresholding values in the method of grading tubules, which reads on the

limitation of grading tubules comparable with that of a physician, i.e. medical expert as in claim 11.

Conclusion

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason Sims, whose telephone number is (571)-272-7540.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Marjorie Moran can be reached via telephone (571)-272-0720.

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the Central PTO Fax Center. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993) (See 37 CFR § 1.6(d)). The Central PTO Fax Center number is (571)-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/ Jason Sims /